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GRUBEOSYLLIS AND *EXOGONE* (EXOGONINAE, SYLLIDAE, POLYCHAETA) FROM CUBA, THE GULF OF MEXICO, FLORIDA AND PUERTO RICO, WITH A REVISION OF *EXOGONE*

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ABSTRACT

Twenty-one species of the genera *Grubeosyllis* Verrill, 1900, and *Exogone* Örsted, 1845 (Exogoninae: Syllidae), principally from Cuba but also from the Gulf of Mexico, Florida and Puerto Rico are reported in this paper. The genus *Grubeosyllis* is re-erected to replace *Pseudobrania* San Martín, 1984, a junior synonym. The genus *Exogone* is revised, three subgenera are proposed: *Exogone* Örsted, 1845, *Parexogone* Mesnil and Caullery, 1916, and *Sylline* Claparède, 1864. Keys of each subgenus for the identification of all species described are given. The following new species are described: *Exogone* (*Parexogone*) *caribensis*, *E.* (*P.*) *wolfi*, *Exogone* (*Exogone*) *rolani*, *E.* (*E.*) *longispinulata*, and *E.* (*E.*) *pseudolourei*. The species and subspecies *Grubeosyllis heterocirra* (Rioja, 1941); *G. vieitezi* (San Martín, 1984); *G. euritmica* (Sardá, 1984); *Exogone* (*Parexogone*) *exmouthensis* Hartmann-Schröder, 1980; *Exogone* (*Parexogone*) *parahomoseta mediterranea* San Martín, 1984; *Exogone* (*Exogone*) *breviantennata* Hartmann-Schröder, 1959; and *Exogone* (*Sylline*) *naidinoides* Westheide, 1974, are new to the Caribbean and Gulf of Mexico area. The species *Grubeosyllis nitidula* Verrill, 1900; *Grubeosyllis rugulosa* Verrill, 1900; *Exogone* (*Parexogone*) *atlantica* Perkins, 1981; *Exogone* (*Exogone*) *dispar* (Webster, 1879); *E.* (*E.*) *lourei* Berkeley and Berkeley, 1948; and *E.* (*E.*) *arenosa* Perkins, 1981, are new to the Cuban fauna. The species *Grubeosyllis nitidula* and *G. rugulosa* are identified tentatively because there is doubt about their correct determination, and *G. nitidula* is re-described on the bases of Cuban specimens. Two species of *Exogone* (*Exogone*) have been identified only to subgenus.

In April 1984, the "Primera Expedición Cubano-Española a la Isla de la Juventud (Isle of Pines) y Archipiélago de los Canarreos (Cuba)" was undertaken. Studies concentrated on coral reef systems and collection of samples of coralline rocks, algae, calcareous sand, hydroids, and sponges for the study of invertebrate fauna, mainly molluscs, crustaceans, and polychaetes. Sampling station descriptions, methods, and a map of collection sites in Cuba were given by San Martín et al. (1986).

The polychaete studies have produced eight papers: San Martín (1986a, 1986b, 1990, 1991, in press), San Martín et al. (1986, San Martín and Major, 1988, San Martín and Gomez Esteban, in press) and report results on the families of "Errantia." The paper of San Martín (1991) constitutes the first report on Syllidae and deals with the exogonid genera *Sphaerosyllis* and *Parapionosyllis*. This report is the second of a series on the Exogoninae collected by the Expedition. The complete work on the Exogoninae was presented at the Second International Polychaete Conference, August, 1986, in Copenhagen, Denmark.

Some new species found in the collection of Cuban syllids were described previously in Volume IV of the "Taxonomic Guide to the Polychaetes of the Northern Gulf of Mexico" without being given specific names (Uebelacker, 1984). The specimens of these new species from the Gulf of Mexico are included here in the type series. Also included in this paper are previously described species and new species not found in Cuba that were reported without specific names in the "Taxonomic Guide," as well as new species from other areas of the Caribbean Sea, Florida, and the Gulf of Mexico. The material reported in the "Taxonomic Guide" was collected for the U.S. Department of Interior, Mineral Management

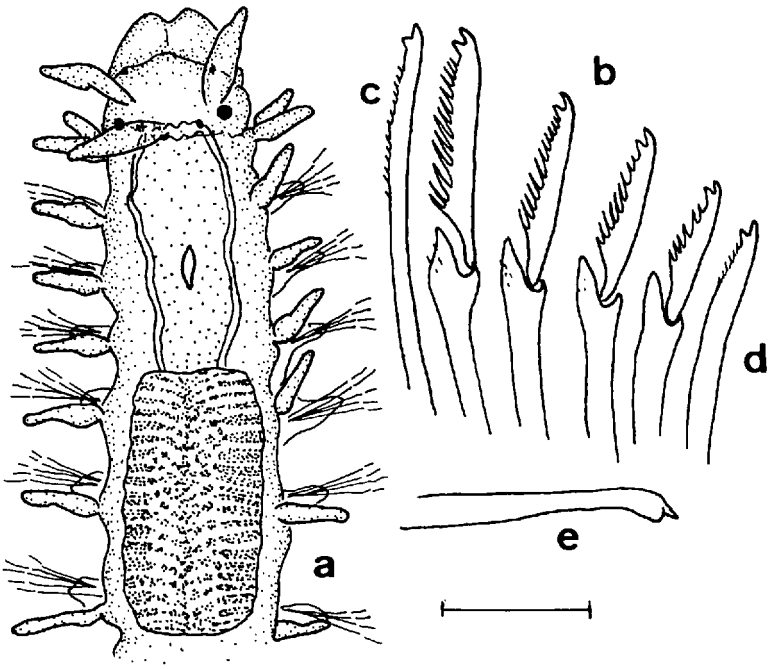

Figure 1. *Grubeosyllis rugulosa* Verrill, 1900: a, anterior end, dorsal view. Midbody segments: b, compound setae; c, dorsal simple seta; d, ventral simple seta; e, acicula. Scale a: 64 μm. b, c, d, e: 10 μm.

Services, contract number 14-12-001-29091. Additional specimens were loaned by the Florida Marine Research Institute, Department of Natural Resources and the U.S. National Museum of Natural History, Smithsonian Institution.

Types and other specimens available for study are deposited in the "Museo Nacional de Ciencias Naturales de Madrid" (MNCNM), Spain; the U.S. National Museum of Natural History (USNM), Washington, D.C.; the Florida Department of Natural Resources Invertebrate Collection (FSBC I), St. Petersburg, Florida; and in the author's collection.

Measurements refer to either the holotype or the largest specimen studied; body width is measured at proventricular level and excluded cirri, parapodia, or setae.

Microscope preparations of some complete specimens were made in glycerine jelly. Observations, camera-lucida drawings, and measurements were made using a microscope with differential interference contrast optics (Nomarsky).

Genus *Grubeosyllis* Verrill, 1900
Pseudobrania San Martín, 1984

Type-species.—*Syllis clavata* Claparède, 1863, herein designated.

Diagnosis.—Body small, slender. Body surface smooth. Prostomium with three antennae, four eyes, and usually two eyespots. Palps well developed, completely fused or with small terminal notch. Two pairs of tentacular cirri. Antennae, tentacular and dorsal cirri fusiform, relatively long and thin; dorsal cirri present on all segments or absent on setiger two in some species. Ventral cirri digitiform. Compound setae and solitary dorsal and ventral simple setae. Acicula acuminate, with long, filiform tip, tip rounded in some species, but not hollow. Pharynx wide,

apparently without marginal papillae; dorsal tooth usually rhomboidal, on anterior half to anterior pharynx margin. Proventriculus proportionally long and wide. Usually two long anal cirri.

Remarks.—San Martín (1984) erected the new genus *Pseudobrania* for an extensive group of species previously included in the genus *Brania,* but which appear more closely related to the genus *Parapionosyllis* Fauvel, 1923.

Quatrefages (1866) described *Brania,* type species *B. pusilla* (Dujardin, 1851) by monotypy, and *Grubea.* Species originally included by Quatrefages in *Grubea* were *Grubea fusifera* Quatrefages and *Syllis clavata* Claparède, two species considered to be synonyms. *Grubeosyllis* was erected by Verrill (1900) specifically as a replacement name for *Grubea,* pre-occupied in Platyhelminthes by *Grubea* Diesing, 1858, a genus of trematodes. Ignoring Verrill, Fauvel (1923) considered *Brania* to be junior synonym of *Grubea.* Hartman (1959) considered *Brania, Grubeosyllis* and *Grubea* to be synonymous, and used the available name *Brania* Quatrefages for the group.

In my opinion, there are two different genera in the group maintained by Hartman in *Brania,* and I propose as correct the denominations *Brania* and *Grubeosyllis.* The latter has priority over *Pseudobrania* San Martín, 1984.

There may be a still older available name for *Grubeosyllis, Protogrubea* Czerniavsky, 1881. However, *Protogrubea,* erected as a subgenus of *Grubea,* is not considered here because generic characters are indeterminable. The description of the type species of *Protogrubea, Grubea* (*Protogrubea*) *atokalis* Czerniavsky, 1881, is inadequate for determination to genus and type material is not known to exist.

Grubeosyllis heterocirra (Rioja, 1941)

Brania heterocirra Rioja, 1941: 700, pl. 3, figs. 11–13; Westheide, 1974:83, figs. 38, 39.

Material Examined.—Cuba: Canal de los vapores, Cayo Bocas de Alonso, Archipiélago de los Canarreos; hydroids on *Rhizophora mangle* roots; 0.5 m depth; 1 specimen (MNCNM).

Distribution.—Pacific coast of Mexico. Galapagos Islands. Cuba.

Grubeosyllis rugulosa Verrill, 1900
Figure 1

Grubeosyllis rugulosa Verrill, 1900: 629.
Brania sp. A, Uebelacker, 1984: 30-19, fig. 30-12.

Material Examined.—Cuba: Canal de Los Vapores, Cayo Bocas de Alonso, Archipiélago de los Canarreos; hydroids on *Rhizophora mangle* roots, 0.5 m depth; 1 specimen. Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos, coarse calcareous sand; 18 m depth; 1 specimen (MNCNM). Same station; inside dead coral; 4 m depth; 1 specimen. U.S.A.: Gulf of Mexico, 29°54′58.6″N, 86°04′58.5″W; calcareous sand; 37 m depth; 2 specimens. 29°42′59.9″N, 85°15′28.6″W; calcareous sand; 67 m depth; 1 specimen. 29°30′N, 84°27′W; medium fine sand; 24 m depth; 1 specimen. Florida, Lower Tampa Bay; 27°36′56″N, 82°41′05″W (J. Taylor-C. Soloman col.); 3.8 m depth; 2 specimens (FSBC I). Florida, John Pennekamp Coral Reef State Park, South Creek Channel marker, 9 m depth; 8 specimens (FSBC I). Gulf of Mexico, off Florida; 24°47′07″N, 0.83°13′05″W; 58 m depth; 3 specimens (USNM). *Brania* sp.; Bermuda, Spanish Port; small boat harbor near sunken barge breakwater; (M. L. Jones col.); (USNM 065877); 1 specimen.

Remarks.—Specimens from the Gulf of Mexico correspond to the description of *Brania* sp. A of Uebelacker (1984). The three specimens from Cuba are smaller, having dorsal cirri relatively shorter, compound setae with blades somewhat shorter and with slightly longer spines, but clearly are young specimens of the same species. One specimen from Cuba has soft lobes at the beginning of the pharynx

that resemble a trepan. Uebelacker (1984) differentiated *Brania* sp. A from *Brania mediodentata* Westheide, 1974, because of differences in the shape of anal cirri and details of compound setae. Anal cirri in the former are short and ovoid, whereas in the latter they are long and slender.

The description of *Grubeosyllis rugulosa* Verrill, 1900, based on a unique specimen, is incomplete, and it is not possible to be certain that these specimens belong to that species. However, some details of the description, especially the shape of dorsal cirri, appear to be very similar to those of the specimens reported here, and for this reason, I assign these specimens to *Grubeosyllis rugulosa* with some doubt. The examined specimen from Bermuda is longer than my Cuban specimens, provided with proportionally longer dorsal cirri and proventriculus, and compound setae with longer blades provided with longer rows of spines, but it belongs to the same species.

Distribution.—Bermuda. Gulf of Mexico. Florida. Cuba.

Grubeosyllis clavata (Claparède, 1863)
Figure 2a, b

Grubea clavata: Fauvel, 1923: 296, fig. 114a–e.
Brania clavata: Ben-Eliahu, 1977: 65, fig. 1.
Pseudobrania clavata: San Martín, 1984: 167, figs. 34, 35.

Material Examined.—Cuba: Archipiélago de los Canarreos, off Cayo Matías; *Turbinaria turbinata*; 3 m depth; 2 specimens. Isle of Pines, off Punta Pedernales; inside living coral; 1.5 m depth; 1 specimen (MNCNM).

Remarks.—The three specimens studied agree with the descriptions of this species. The pharyngeal tooth is slightly in front of the mid-line of the pharynx. Blades of compound setae are bidentate with the proximal tooth smaller than the distal one, and there is dorso-ventral gradation in the length of blades.

Distribution.—Considered to be cosmopolitan.

Grubeosyllis vieitezi (San Martín, 1984)
Figure 2e, f

Pseudobrania vieitezi San Martín, 1984: 160, figs. 31, 32.

Material Examined.—Cuba: Isle of Pines, off Punta Pedernales; inside living coral; 1.5 m depth; 1 specimen (MNCNM).

Remarks.—The only specimen collected agrees with the original description, except that its color is not perceptible. The pharynx and proventriculus are relatively long. The pharyngeal tooth is slightly set back from the anterior margin. Blades of the dorsal-most compound setae have very long, distally dressed rows of spines, and blades of remaining compound setae have short and straight spines.

This species is very similar to *G. concinna* (Westheide, 1974) but differs in the shape of acicula.

Distribution.—Spanish Mediterranean coasts. Cuba.

Grubeosyllis euritmica (Sardá, 1984)
Figure 2c, d

Pseudobrania euritmica Sardá, 1984: 10, fig. 1.

Material Examined.—Cuba: Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos; *Halimeda* sp. in *Thalassia testudinum* beds; 2 m depth; 2 specimens (MNCNM).

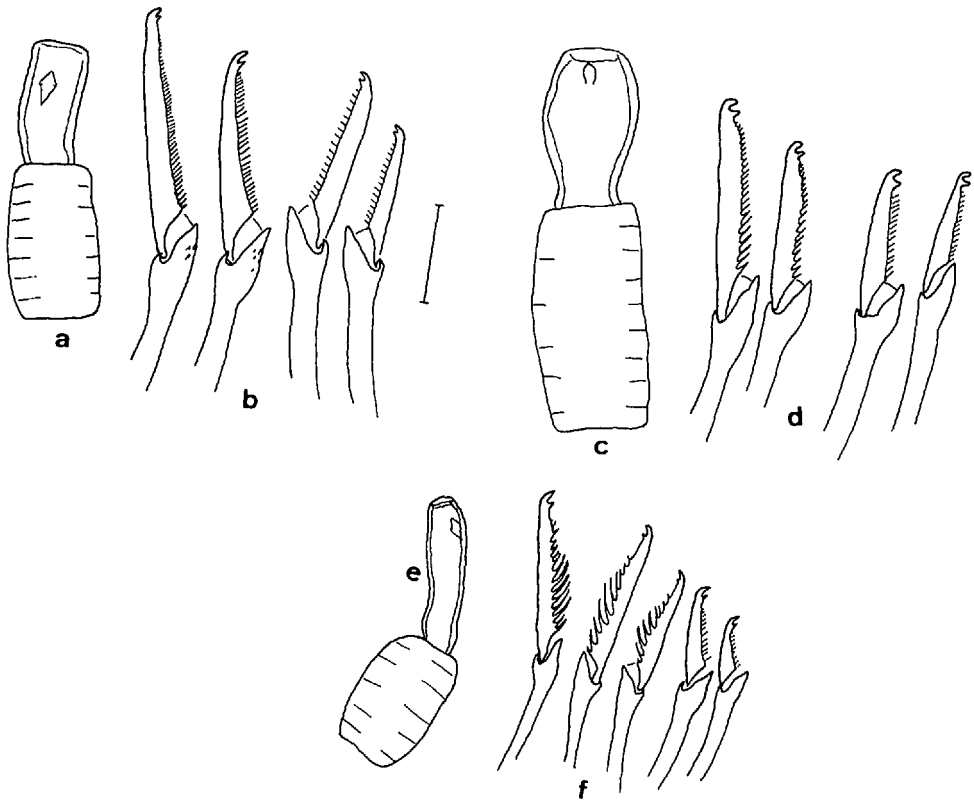

Figure 2. *Grubeosyllis clavata* (Claparède, 1863): a, pharynx and proventriculus; b, compound setae, midbody segment. *Grubeosyllis euritmica* (Sardá, 1984): c, pharynx and proventriculus; d, compound setae, midbody segment. *Grubeosyllis vieitezi* (San Martín, 1984): e, pharynx and proventriculus; f, compound setae, midbody segment. Scale a, c, e: 64 μm. b, d, f: 10 μm.

Remarks.—These specimens agree with the original description of the species, and I have been able to confirm this by comparison of Cuban specimens with specimens from the Spanish Mediterranean coast.

Distribution.—Atlantic and Mediterranean coasts of Southern Spain. Cuba.

Grubeosyllis nitidula Verrill, 1900
Figure 3

Grubeosyllis nitidula Verrill, 1900: 628.

Material Examined.—Cuba: Isle of Pines, off Punta Pedernales; inside living coral; 1.5 m depth; 7 specimens. Isle of Pines, off Punta del Francés; inside coralline rock from rubble and pavement zone; 1 m depth; 16 specimens. Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos; *Halimeda* sp. in *Thalassia testudinum* beds; 2 m depth; 86 specimens (USNM). Off Cayo Matías, Turbinaria turbinata; 3 m depth; 13 specimens (MNCNM). Same station; *Halimeda* sp.; 3 m depth; 8 specimens. Between Punta del Este and Cayo Matías; coarse calcareous sand; 18 m depth; 1 specimen. Isle of Pines, off Punta del Francés; algae; 4 m depth; 17 specimens. Canal de los Vapores, Cayo Bocas de Alonso, Archipiélago de los Canarreos, in sponges on *Rhizophora mangle* roots; 0.5 m depth; 1 specimen. Same station; hydroids on *Rhizophora mangle* roots; 0.5 m depth; 22 specimens. Off Cayo Matías; *Stypopodium zonale*; 3 m depth; 12 specimens. Between Punta del Este and Cayo Matías; algae; 18 m depth; 9 specimens. Off Cayo Matías; floating sargassum; 1 specimen. U.S.A.: as *Brania clavata*, Gulf of Mexico, Texas, off Port Aransas, Hospital Rock, 27°32′05″N, 96°28′19″W; 75 m depth; 1 specimen (USNM). Florida, Old Tampa Bay, 27°51′55″N, 82°32′33″W;

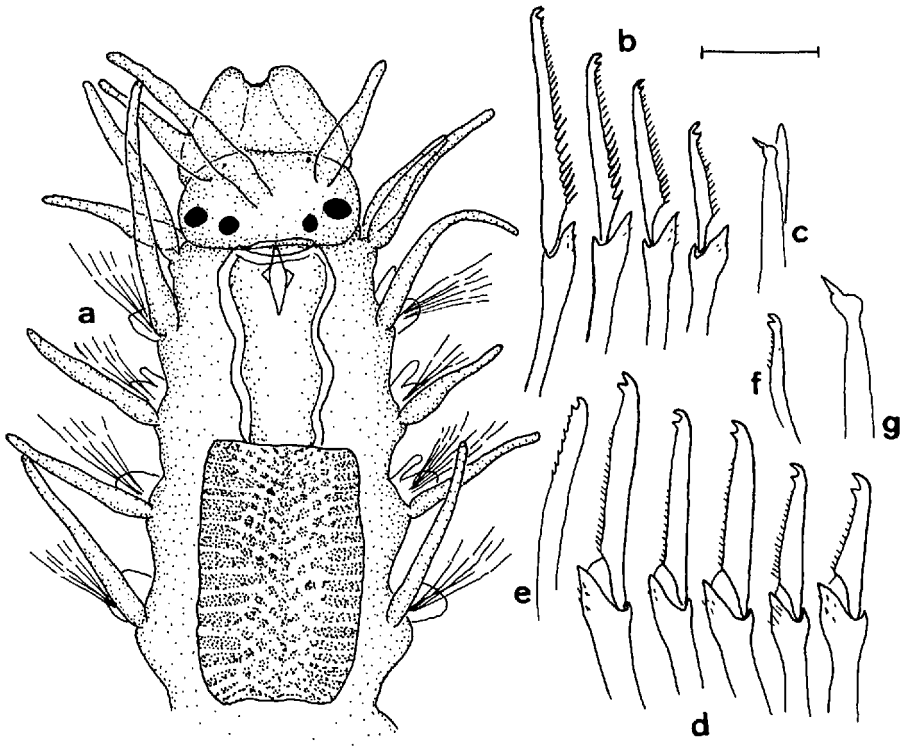

Figure 3. *Grubeosyllis nitidula* Verrill, 1900: a, anterior end dorsal view. Anterior segments: b, compound setae; c, aciculae. Posterior segments: d, compound setae; e, dorsal simple seta; f, ventral simple seta; g, acicula. Scale a: 32 μm. b, c, d, e, f, g: 10 μm.

1 m depth; (J. Taylor-C. Soloman col.); 21 specimens (FSBC I). Florida, John Pennekamp Coral Reef State Park, South Creek Channel marker; (R. J. Helbling col.); 2 specimens (FSBC I). *Brania websteri* (Verrill); Bermuda, Spanish Port; rocks and under rocks; (M. L. Jones col.); (USNM 65874); 13 specimens. *Brania websteri* (Verrill); Bermuda, Spanish Point; (M. L. Jones col.); (USNM 65893); 7 specimens.

Description.—Body small, without color markings. Mature male 1.8 mm long, 0.14 mm wide, 21 setigers; egg bearing female 1.64 mm long, 0.16 mm wide, 22 setigers. Prostomium subrectangular, twice wider than long. Eyes, four, large in open trapezoidal arrangement, anterior pair large, even larger in mature specimens; two anterior eyespots. Median antenna originating between anterior eyes, approximately same length as prostomium and palps together. Lateral antennae originating near but set back from eyespots, shorter than median. Palps slightly longer than prostomium, fused except for terminal notch. Ventral tentacular cirri slightly shorter than dorsal ones. Dorsal cirri longer than median antenna on first setiger; half length of those of first setiger on second setiger, gradually longer to setiger four but slightly shorter than those of first setiger. Compound setae with marked dorso-ventral and antero-posterior gradation in shape and length of blades. Anterior parapodia each with 6–7 compound setae, blades thin, long, slightly bidentate, proximal and distal teeth very close, blades of dorsal-most setae 30 μm long, ventral-most 14 μm long; longer blades with moderate, fine, distally dressed row of spines, shorter blades with short, straight spines. Blades posteriorly progressively more clearly bidentate, with proximal tooth almost as thick and more separated from distal one. Longest blades in posterior parapodia 25 μm,

shorter blades about 15 μm, all with short, straight spines. Dorsal simple seta usually present from first setiger, solitary, slightly spinulose on concave side, bifid. Ventral simple seta present in far posterior setigers, solitary, bidentate, slightly spinulose. Two aciculae in anterior parapodia, one straight, other subterminally thickened, ending in curved, triangular tip; solitary acicula on remaining parapodia of latter shape. Pharynx short, through 2–3 segments; pharyngeal tooth relatively long, large, rhomboidal, on anterior margin. Proventriculus through 2½–3 setigers, with about 16 muscle cell rows. Pygidium small, rounded, with two long anal cirri. Mature males with long natatory setae from setiger 9 and sperm from setiger 8. Mature females without natatory setae, with ovocites in 10 setigers from setiger 9.

Remarks.—I attibute these specimens to the species *G. nitidula* Verrill, 1900, with considerable doubt. Some very important characters are omitted in the original description, such as the position of the pharyngeal tooth and details of compound setae; therefore it is not possible to be sure of a correct identification. In general, specimens reported here appear to be very similar to those described by Verrill; and the specimens from Bermuda belong to the same species.

Distribution.—Bermuda. Gulf of Mexico. Cuba.

Genus *Exogone* Örsted, 1845

Diagnosis.—Body small, slender, more or less filiform. Prostomium with three antennae, exceptionally without antennae; usually with four eyes, sometimes also with two eyespots, occasionally without eyes. Palps well developed, completely fused or with terminal notch. Single pair of minute tentacular cirri. Dorsal cirri usually very small, papilliform to oval, present on all segments or absent from setiger two in adults of some species. Usually compound setae and solitary dorsal and ventral simple setae. Two anal cirri usually long. Body surface smooth. Pharynx with anterior margin surrounded by soft lobes, with anterior tooth. Females carrying eggs, sometimes embryos, on ventral sides of parapodia notoacicula and natatory setae usually present at sexual maturity; some species viviparous.

Remarks.—Difficulty in observing minute antennae and tentacular, dorsal, and ventral cirri has caused great confusion in diagnoses of some genera confirmed as synonyms of *Exogone*. As a result, the genera *Oophylax* Ehlers and *Microsyllis* Claparède were defined as having only 2 antennae, *Cystonereis* Kölliker as having 4 antennae, *Exotokas* Ehlers, 1897, as lacking ventral cirri, and *Exogone* as lacking tentacular cirri. The only synonym of *Exogone* given an adequate description is *Paedophylax* Claparède (Langerhans, 1879, p. 523). Hartman and Fauchald (1971) described the genus *Exogonita*; this genus is very similar to *Exogone* but lacks antennae and two pairs of tentacular cirri. I have examined the type-series of *Exogonita oculata*, the only species of the genus, and it lacks antennae, but it has a solitary pair of tentacular cirri. This genus is considered here as a synonym of *Exogone*.

There are three well-defined groups in *Exogone* that, in my opinion, must be considered as three different subgenera: *Parexogone* Mesnil and Caullery, 1916; *Exogone* Örsted, 1845; and *Sylline* Claparède, 1864 (see below). For each of these subgenera, a short diagnosis and a key of all species described are given. Numbers with asterisks in the keys indicate references for descriptions of species for which species accounts have not been provided.

In my opinion, the subgenus *Parexogone* is more primitive than the remaining subgenera for the following reasons: 1) In *Parexogone* the shapes of simple and

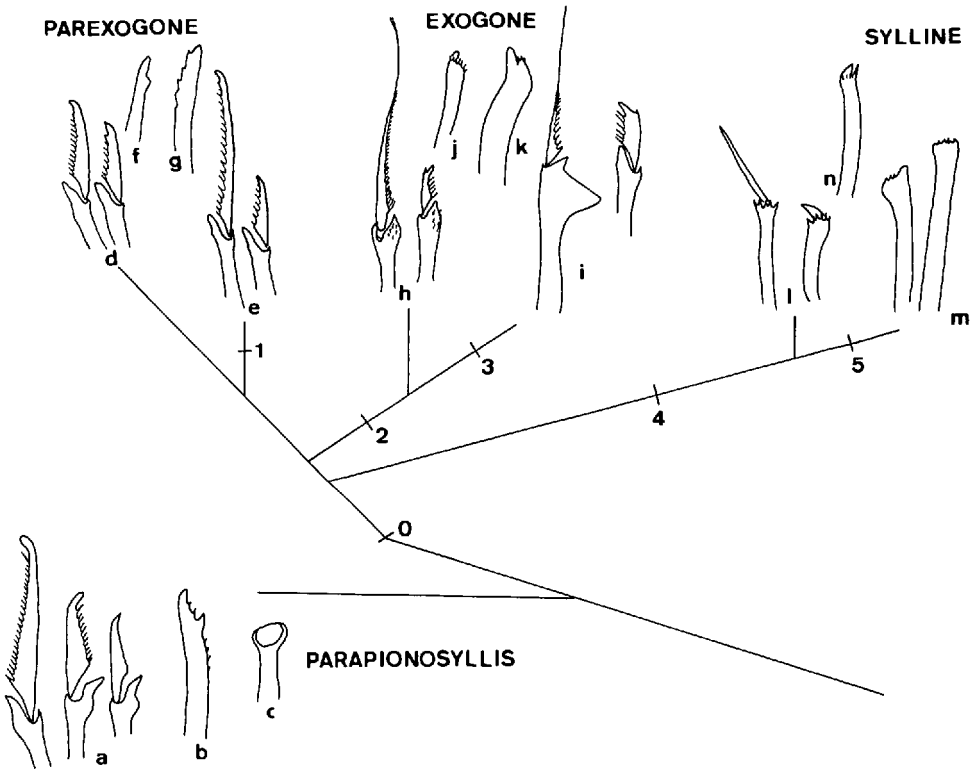

Figure 4. Interpretation of the evolution of the setae in the genus *Exogone*. The genus *Parapionosyllis* is considered as the most similar genus. Genus *Parapionosyllis*: a, Upper, medium and lower compound setae; b, Dorsal simple seta; c, acicula. (From *P. minuta*, after Campoy, 1982.) Genus *Exogone*: Subgenus *Parexogone*. d, Group of species with only similar falcigers (from *E.* (*P.*) *hebes*, after San Martín et al., 1985); e, group of species with falcigers and similar but longer spinigers (*from E.* (*P.*) *atlantica*, after Perkins, 1981); f, g, typical dorsal simple seta (from *E.* (*P.*) *hebes* and *E.* (*P.*) *parahomoseta*, after San Martín et al., 1985 and San Martín, 1984). Subgenus *Exogone*: h, group of species with spinigers without enlarged shafts and falcigers provided with long proximal tooth (from *E.* (*E.*) *verugera* after Campoy, 1982); i, group of species with enlarged, modified shafts of spinigers on the first, second or both setigers, and remaining setae of the same kind of the later group (from *E.* (*E.*) *pseudolourei*); j, anterior dorsal simple seta; k, posterior dorsal simple seta (both from *E.* (*E.*) *rolani*). Subgenus *Sylline*: l, group of species with blades partially fused to shafts (from *E.* (*S.*) *naidinoides*); m, group of species without blades (from *E.* (*S.*) *simplex*, after Hartmann-Schröder, 1960); n, dorsal simple seta (from *E.* (*S.*) *naidinoides*). Characters: 0. Body filiform. Tentacular, dorsal and ventral cirri papillate. 1. Some setae with long, spinigerous blades. 2. Shafts of setae strongly spinulose. Dorsal simple setae of middle and posterior segments enlarged, differing from those of anterior segments. Blades of spinigers with long, fine tips. Blades of falcigers with proximal tooth much larger than distal tooth. 3. Shafts of spinigers of 1–2 anterior setigers with large, triangular process on long part of hinge. 4. Shafts of compound setae with truncated, serrated tips. Blades partially fused to shafts. 5. Blades of setae lost.

compound setae are typical of most Syllidae (Fig. 4a–g) and very similar to other closely related genera such as *Sphaerosyllis, Parapionosyllis*, and *Brania*, whereas in *Exogone* (Fig. 4h–k) and *Sylline* (Fig. 4l–n) they are more specialized. 2) In *Parexogone* the three antennae usually originate separately and in locations similar to those of remaining syllid genera, whereas in the remaining subgenera the three antennae commonly originate close to each other, more or less at the middle of prostomium, sometimes in front of the eyes.

An evolutionary interpretation of the shape of compound setae is shown in Figure 4.

The following species are not included in the keys to species for the reasons indicated: *Exogone glandulosa* Rioja, 1943 (=*Parapionosyllis* species); *Exogone turqueti* Gravier, 1906; *E. monilicornis* Langerhans, 1879; *E. insignis* Langerhans, 1879; *E. tatarica* Annenkova, 1938; *E. langerhansi* (Czerniavsky, 1881); *E. claparedii* (Langerhans, 1879); *E. maderensis* (Czerniavsky, 1881); *E. cirrata, E. edwarsii* and *E. oerstedii* Kölliker in Koch, 1864; *E. martinsii* Pagenstecher, 1862, all with inadequate descriptions; and *E. minuta* (Treadwell, 1937) (=*Sphaerosyllis* species, fide Hartman, 1956).

Subgenus *Parexogone* Mesnil and Caullery, 1916

Type-species.—*Paedophylax hebes* Webster and Benedict, 1884, herein designated.

Diagnosis.—Compound setae all with "normal" heterogomph hinges, falcigers all similar in shape and length or falcigers and "normal" heterogomph spinigers with shaft tips simple, blades relatively similar to falcigers but longer. Dorsal simple setae similar throughout body, tips unidentate or bidentate.

Remarks.—Five species or subspecies of this genus are reported or described herein: *Exogone* (*Parexogone*) *atlantica* Perkins, 1981; *E.* (*P.*) *caribensis* n. sp.; *E.* (*P.*) *exmouthensis* Hartmann-Schröder, 1980; *E.* (*P.*) *wolfi* n. sp.; and *E.* (*P.*) *paraho-moseta mediterranea* San Martín, 1984.

Key to Species of *Parexogone*

1a. Dorsal simple setae with one or more long subterminal spines (aristae) clearly surpassing tips. Compound setae including both spinigers and falcigers 2
1b. Dorsal simple setae without aristae 5
2a. Blades of falcigers each with solitary arista beginning at the base and extending to near tips ..... *E.* (*P.*) *longicirris* (Webster and Benedict, 1887) *30, *37
2b. Blades of falcigers without aristae, smooth or with normal row of spines 3
3a. Median antenna relatively thick, slightly longer than prostomium and palps together ..... *E.* (*P.*) *remanei* Storch, 1966 *34
3b. Median antenna slender, much longer than prostomium and palps together 4
4a. Lateral antennae minute. Dorsal simple setae each with solitary thick spine. Blades of compound setae unidentate; longer blades with strongly hooked tips ..... *E.* (*P.*) *furcifera* Eliason, 1962 *10
4b. Lateral antennae similar in length to prostomium. Dorsal simple setae each with 2–3 long, fine aristae. Blades of compound setae bidentate ..... *E.* (*P.*) *wolfi* n. sp.
5a. Without eyes. Blades of compound setae smooth. Blades of spinigers unidentate and those of falcigers bidentate, with proximal tooth smaller than distal one . *E.* (*P.*) *fauveli* Cognetti, 1961 *6
5b. With eyes 6
6a. Two different kinds of compound falcigers: typical falcigers and falcigers with very spinulose shafts and short blades with long spines ..... *E.* (*P.*) *heterosetoides* Hartmann-Schröder, 1979 *21, *25
6b. Compound falcigers similar, without very spinulose shafts and short blades with long spines 7
7a. All setae compound falcigers with slight dorso-ventral gradation in lengths 8
7b. Compound setae including falcigers and spinigers similar to falcigers but longer 16
8a. Adults with dorsal cirri on the second setiger 9
8b. Adults without dorsal cirri on the second setiger 10
9a. Median antenna originating at anterior margin of prostomium, clearly larger than lateral ones; lateral ones minute ..... *E. (P.) heboides* Ben-Eliahu, 1977 *3
9b. Median antenna originating at posterior margin of prostomium; median and lateral antennae all minute ..... *E.* (*P.*) *exmouthensis* Hartmann-Schröder, 1980
10a. Dorsal simple setae clearly bidentate, each with large secondary tooth 11
10b. Dorsal simple setae unidentate or very slightly bifid 13
11a. Dorsal simple setae smooth, blades of compound setae with short spines ..... *E.* (*P.*) *hebes* (Webster and Benedict, 1884) *11, *4, *36, *19, *32
11b. Dorsal simple setae serrated on concave edge 12
12a. Dorsal simple setae strongly serrated. Blades of compound setae short, without dorso-ventral

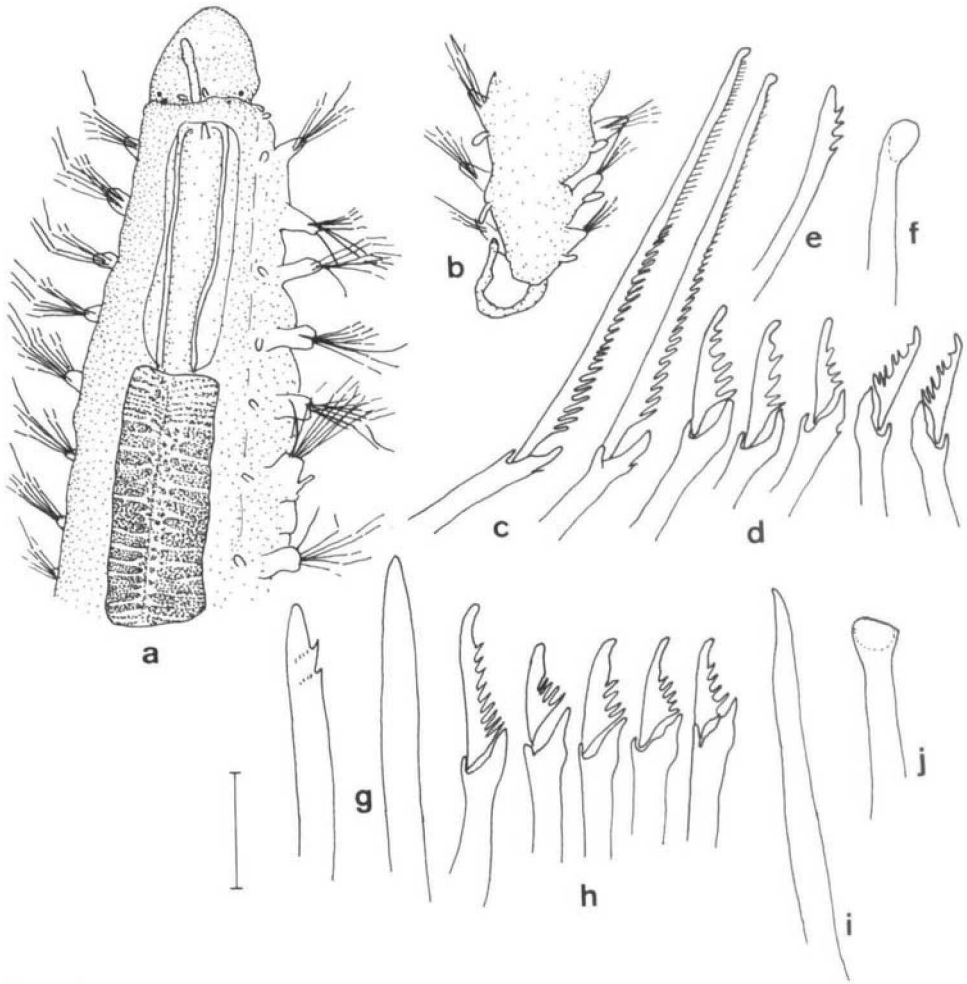

Figure 5. *Exogone* (*Parexogone*) *caribensis* n. sp.: Holotype. a, anterior end, dorsal view; b, posterior end, dorsal view; Anterior segments: c, spinigers; d, falcigers; e, dorsal simple seta; f, acicula; Posterior segments: g, dorsal simple seta; h, compound setae; i, ventral simple seta; j, acicula. Scale a, b: 0.13 mm. c, d, e, f, g, h, i, j: 10 μm.

gradation in lengths, and with long, stout spines ..... *E.* (*P.*) *parahomoseta* Hartmann-Schröder, 1974 *31, *20

12b. Dorsal simple setae slightly serrated. Blades of compound setae with dorso-ventral gradation in lengths, with short, fine spines ..... *E.* (*P.*) *sexoculata* Hartmann-Schröder, 1979 *21

13a. Dorso-ventral gradation in lengths of blades of compound setae 14

13b. All compound setae with blades of similar length 15

14a. Blades of compound setae bidentate ..... *E.* (*P.*) *homosetosa* Hartmann-Schröder, 1965 *18

14b. Blades unidentate ..... *E.* (*P.*) *minuscula* Hartman, 1953 *18, *14

15a. All antennae originating at posterior margin of prostomium ..... *E.* (*P.*) *normalis* Day, 1963 *7, *8

15b. Lateral antennae originating on anterior margin of prostomium, median antenna on posterior margin ..... *E.* (*P.*) *parahebes* Hartmann-Schröder, 1965 *18

16a. Antennae all minute 17

16b. Median antenna longer than lateral ones 19

17a. Proventriculus through 2 segments ..... *E.* (*P.*) *microtentaculata* Westheide, 1974 *38

17b. Proventriculus through more segments 18

18a. Proventriculus through 4 setigers, simple dorsal setae serrated, ventral simple setae slightly bidentate, anal cirri long ..... *E.* (*P.*) *atlantica* Perkins, 1981

18b. Proventriculus through 5 setigers, simple dorsal setae smooth posteriorly, ventral simple setae unidentate and smooth ..... *E.* (*P.*) *cognettii* Castelli, Badalamenti and Lardicci, 1987 *5
19a. Median antenna shorter than prostomium and palps together ..... *E.* (*P.*) *caribensis* n. sp.
19b. Median antenna longer, or of same length, than prostomium and palps together 20
20a. Adults with dorsal cirri on the second setiger ..... *E.* (*P.*) *convoluta* Campoy, 1982 *4
20b. Adults without dorsal cirri on the second setiger 21
21a. Lateral antennae minute. Spinigers unidentate ..... *E.* (*P.*) *molesta* Banse, 1972 *2
21b. Lateral antennae about ⅓ as long as the median antenna. Spinigers bidentate ..... *E.* (*P.*) *obtusa* Hartmann-Schröder and Rosenfeldt, 1988 *26

Exogone (*Parexogone*) *atlantica* Perkins, 1981

Exogone atlantica Perkins, 1981: 1097, fig. 7; Uebelacker, 1984: 30–34, fig. 30-28.

Material Examined.—Cuba: Archipiélago de los Canarreos, off Cayo Matías; *Halimeda* sp.; 3 m depth; 1 incomplete specimen.

Distribution.—Florida. Gulf of Mexico. Cuba.

Exogone* (*Parexogone*) *caribensis new species
Figure 5

Exogone sp. B. Uebelacker, 1984:30–39, fig. 30-31.

Material Examined.—U.S.A.: South Texas Outer Continental Shelf, Hospital Rock Station, 27°32′5″N, 96°28′19″W; 75 m depth; holotype and three paratypes (USNM). Florida, off Palm Beach, 26°45′5″N, 79°59′5″W; 63 m depth; coarse sand and rubble; 1 specimen (FSBC I). Gulf of Mexico, MAFLA Sta. 2211, 27°56′29.5″N, 83°52′59.5″W; coarse sand; 1 specimen (USNM). SOFLA Sta. 22, 25°17′11″N, 83°2′0.4″W; 53 m depth; three paratypes (USNM). SOFLA Sta. 28, 24°47′7″N, 83°13′5″W; 58 m depth; one paratype (USNM). SOFLA Sta. 24; 25°16′54″N, 83°43′11″W; 88 m depth; three paratypes (USNM).

Description.—Body long, thin, without color markings, about 3.6 mm long, 0.2 mm wide, 37 setigers. Prostomium rectangular, broader than long. Two pair very small eyes on posterior margin of prostomium; antennae close to each other, originating on posterior margin, median antenna fusiform, longer than prostomium but shorter than prostomium and palps together, lateral antennae small, ovoid. Palps triangular, broad, completely fused. First setiger covering posterior dorsal margin of prostomium. Dorsal cirri absent on second setiger. Tentacular and dorsal cirri ovoid, minute, longer posteriorly. Ventral cirri similar but slightly shorter. Anterior parapodia each with 1–3 spinigers and about 12 falcigers; shafts distinctly heterogomph; blades of spinigers unidentated, distally blunt, with short, coarse spines, about 45 μm long; blades of falcigers unidentate or sub-bidentate, coarsely serrated, with dorso-ventral gradation in length, 25 μm long above, 10 μm long below. Compound setae, especially spinigers, shorter posteriorly; only falcigers on far posterior segments, all similar, about 12 μm long, 4 per parapodium. Dorsal simple setae from first setigers, solitary, unidentate, coarsely serrated anteriorly, appearing smooth on posterior setigers but serrated on close examination. Ventral simple setae on more posterior setigers, solitary, unidentate, smooth or slightly serrated on concave margin. Acicula solitary, with rounded tips, apparently hollow distally. Pharynx slightly longer than proventriculus, 3½ segments, with about 20 muscle rows. Two long anal cirri (one missing on holotype).

Remarks.—*Exogone* (*P.*) *caribensis* n. sp. is closely related to *E.* (*P.*) *atlantica* Perkins, 1981, from the same area; *E.* (*P.*) *microtentaculata* Westheide, 1974, from Galapagos Islands; and *E.* (*P.*) *cognettii* Castelli, Badalamenti and Lardicci, 1987, from the Mediterranean Sea. Compound and simple setae are very similar, but *E.*

(*P.*) *caribensis* differs from the species mentioned above in having a longer median antenna and in details of compound and simple setae.

Etymology.—From the Caribbean Sea (Spanish: Mar Caribe).

Exogone (*Parexogone*) *exmouthensis* Hartmann-Schröder, 1980

Exogone exmouthensis Hartmann-Schröder, 1980: 57, figs. 45, 46.

Material Examined.—Cuba: Isle of Pines, off Punta del Francés; inside coralline rock from rubble and pavament zone; 1 m depth; 3 specimens (MNCNM). Archipiélago de los Canarreos, off Cayo Matías; *Halimeda* sp.; 3 m depth; 1 specimen. Same station; *Turbinaria turbinata*; 3 m depth; 1 specimen.

Remarks.—This species apparently has viviparous reproduction; developing embryos have been found in posterior part of body of two specimens. One of them apparently with 4 embryos, one each in 4 setigers.

Viviparity in *E.* (*P.*) *exmouthensis* is similar to that which has been reported in other closely related species, *E.* (*P.*) *hebes* by Pocklington and Hutchenson (1983) and *E.* (*P.*) *parahomoseta mediterranea* by San Martín (1984).

Distribution.—Australia. Cuba.

Exogone* (*Parexogone*) *wolfi new species
Figure 6

Exogone sp. A. Uebelacker, 1984: 30–37, fig. 30-30.

Material Examined.—U.S.A.: Florida, off Port Everglades, 26°0.9'N, 80°3.4'W; 188 m depth; muddy sand; holotype (USNM). Gulf of Mexico, MAFLA Sta. 2645, 29°35'N, 87°20'0.22"W; coarse sand; 106 m depth; paratype (USNM).

Description.—Body long, slender, 6 mm length, 0.2 mm width, 43 setigers. Prostomium rectangular, slightly wider than long. Four large eyes in trapezoidal arrangement, very close to each other on each side, pair of very small anterior eyespots. Median antenna originating between anterior pair of eyes, twice longer than prostomium and palps together, lateral antennae much shorter, similar in length to prostomium, originating at about midlength of prostomium in front of anterior pair of eyes. Palps slender, nearly twice longer than prostomium, completely fused. Peristomium covering dorsal posterior margin of prostomium. Tentacular cirri slightly shorter than dorsal cirri. Dorsal cirri on all setigers, oval, slightly longer than parapodial lobes. Ventral cirri similar, but shorter. Compound setae including both spinigers and falcigers; spinigers with very long blades; blades bidentate, with long, very fine spines; blades of falcigers with dorso-ventral gradation in length. Anterior parapodia each with about 3 spinigers with blades 35 μm long, and 10 falcigers; median and posterior parapodia each with 2 spinigers with blades 80 μm long, and 3 falcigers with blades 22–18 μm long; all blades with long, fine subterminal spines, reaching and even surpassing tips. Shafts of falcigers with long, fine subterminal spines on long part of hinge. Solitary dorsal simple setae present from proventricular setigers, each tapering towards tip, bidentate, with 2–3 very long subterminal spines. Solitary ventral simple setae present in more posterior setigers, similar to dorsal simple setae, but thicker, more strongly bidentate, and with shorter subterminal spines. Anterior parapodia each with 3 aciculae, more posteriorly 2, only 1 in far posterior setigers; tip bent in right angle. Pharynx long, through 5 segments; tooth anterior. Proventriculus short, through 1½ segments, with about 15 muscle cell rows.

Etymology.—The species is named in honor of Mr. Paul S. Wolf, Barry and Vittor Associates, Mobile, Alabama, U.S.A.

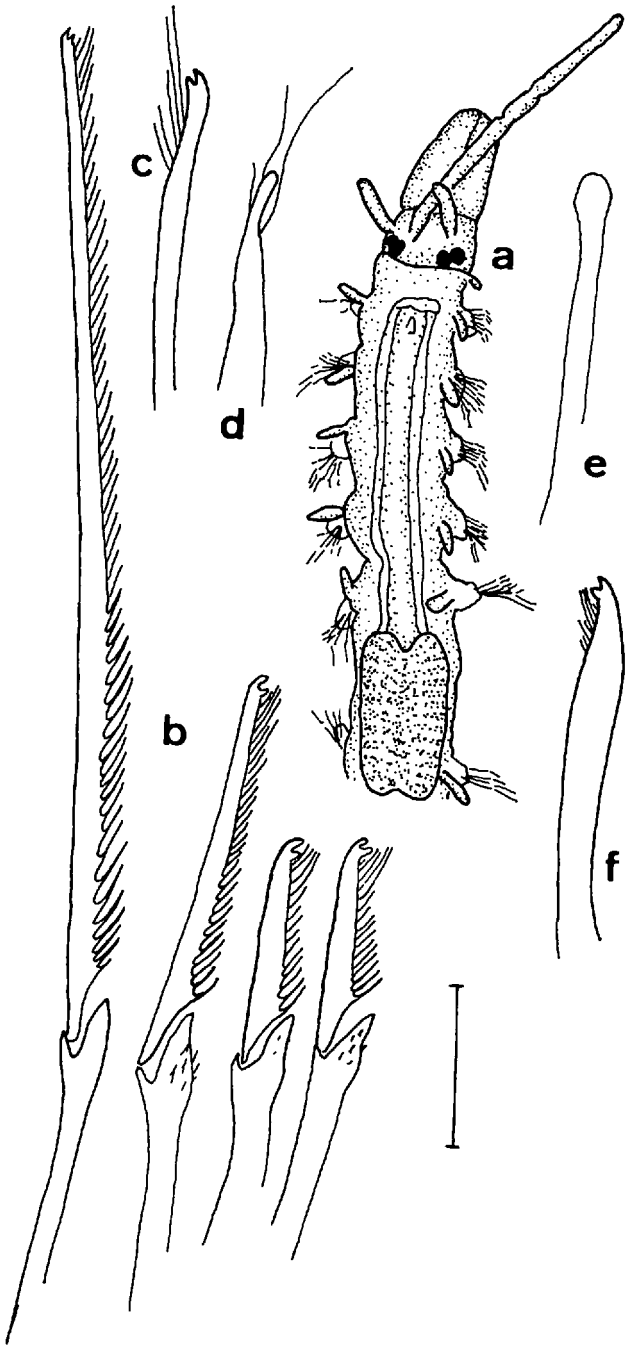

Figure 6. *Exogone* (*Parexogone*) *wolfi* n. sp.: a, anterior end, dorsal view (modified from Uebelacker, 1984). Midbody segments: b, compound setae; c, d: lateral and dorsal view of dorsal simple seta; e, acicula; f, ventral simple seta. Scale a: 0.13 mm. b, c, d, e, f: 10 μm.

Exogone (Parexogone) parahomoseta mediterranea San Martín, 1984
Figure 7h, i

Exogone parahomoseta mediterranea San Martín, 1984: 204, fig. 45.

Material Examined.—U.S.A.: Florida, Anglefish Creek, north end of John Pennekamp Coral Reef State Park; 2 specimens (USNM).

Distribution.—Spanish Mediterranean coasts. Florida.

Subgenus *Exogone* Örsted, 1845

Gossia Quatrefages, 1865
Schmardia Quatrefages, 1865
Paedophylax Claparède, 1868
Exotokas Ehlers, 1864
Exogonita Hartman and Fauchald, 1971

Type-species.—*Exogone naidina* Örsted, 1845, by monotypy.

Diagnosis.—Compound setae on each setiger, including both spinigers with very fine, usually bifid blades and falcigers with short, bidentate blades, with proximal tooth much longer than distal tooth, with shaft tips usually complex; tips of dorsal simple setae of first setigers finely spinulose subterminally and with rounded tip; dorsal simple setae increasing in thickness posteriorly and changing in shape. Antennae reduced or absent in some species.

Remarks.—Nine species of this subgenus are reported or described herein: *Exogone (Exogone) dispar* (Webster, 1879); *E. (E.) breviantennata* Hartmann-Schröder, 1959; *E. (E.) rolani* n. sp.; *E. (E.)* sp. A; *E. (E.) longispinulata* n. sp.; *E. (E.) lourei* Berkeley and Berkeley, 1948; *E. (E.) pseudolourei* n. sp.; *E. (E.) arenosa* Perkins, 1981; and *E. (E.)* sp. B.

Key to Species of *Exogone*

1a. Antennae absent 2
1b. Antennae present 3
2a. With dorsal cirri on second setiger. Shafts of spinigers with long spines ..... *E. (E.) acerata* San Martín and Parapar, 1990 *33
2b. Without dorsal cirri on second setiger. Shafts of spinigers nearly smooth ..... *E. (E.) oculata* (Hartman and Fauchald, 1971) *16
3a. Spinigers on anterior few parapodia numbering 1–2, with shafts having large, stout, triangular process near tips 4
3b. Shafts of spinigers without large, stout triangular process 8
4a. Modified spinigers only on first setiger ..... *E. (E.) rostrata* Naville, 1933 *31, *1, *29
4b. Modified spinigers on second setiger 5
5a. All antennae short, more or less spherical ..... *E. (E.) uniformis* Hartman, 1961 *2, *15
5b. Median antenna clearly longer than lateral ones 6
6a. Dorsal simple setae of median and posterior setigers enlarged and modified, strongly bidentate. Proventriculus short ..... *E. (E.) pseudolourei* n. sp.
6b. Median and posterior dorsal simple setae not so modified 7
7a. Dorsal simple setae with long, thin secondary spine near tips. Proventriculus about equal in length to pharynx, with about 33 rows of muscle cells ..... *E. (E.) arenosa* Perkins, 1981
7b. Dorsal simple setae without secondary spine. Proventriculus shorter than pharynx, with about 20 muscule cell rows (modified spinigers also on the first setiger sometimes) ..... *E. (E.) lourei* Berkeley and Berkeley, 1948
8a. Compound setae of first 2–3 setigers with falcigerous short blades, distinctly different from those of following segments, unidentate with long basal spine; following setigers with spinigers and falcigers ..... *E. (E.) naidina* Örsted, 1845 *4, *31, *3, *19
8b. Compound setae of first setigers not distinctly different from those of other setigers 9

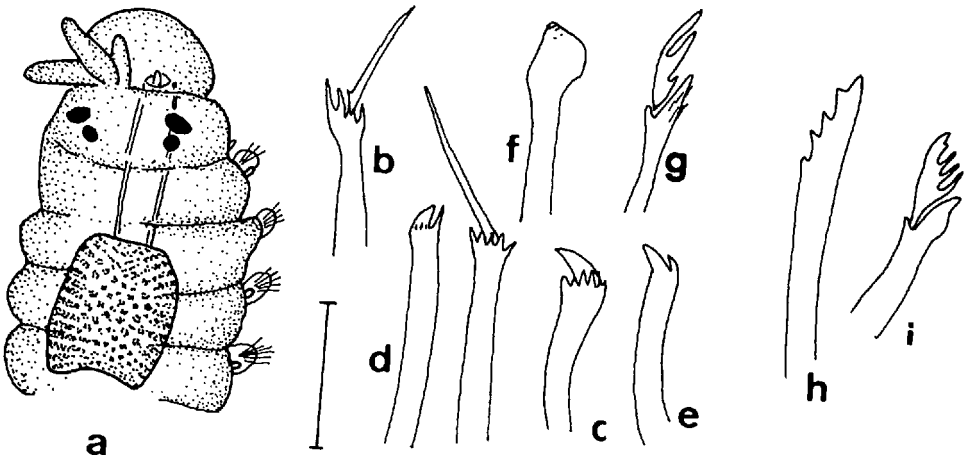

Figure 7. *Exogone* (*Sylline*) *naidinoides* Westheide, 1974: a, anterior end, dorsal view. Anterior segment: b, compound seta. Posterior segment: c, compound setae; d, dorsal simple seta; e, ventral simple seta; f, acicula. *Exogone* (*Exogone*) sp. A: g, compound seta of second setiger. *Exogone* (*Parexogone*) *parahomoseta mediterranea* San Martín, 1984: Midbody segment: h, dorsal simple seta; i, compound seta. Scale a: 64 μm. b, c, d, e, f, g, h, i: 10 μm.

9a. Dorsal simple setae with 2 long aristae surpassing tips. Ventral simple setae with one shorter arista. Blades of falcigers with long subterminal spine surpassing tips ..... *E.* (*E.*) *aristata* Hartmann-Schröder, 1982 *24
9b. Dorsal simple setae without aristae 10
10a. Blades of falcigers with very long, fine, distally dressed spines surpassing tips ..... *E.* (*E.*) *longispinulata* n. sp.
10b. Blades with relatively short, straight spines 11
11a. All antennae similar 17
11b. Median antenna at least twice as long as lateral ones 13
12a. Adults without dorsal cirri on second setiger. Proventriculus long, through about 4 segments. Antennae between eyes ..... *E.* (*E.*) *verugera* Claparède, 1868 *11, *4, *31
12b. Adults with dorsal cirri on second setiger. Proventriculus short, through about 2 segments. Antennae in front of eyes ..... *E.* (*E.*) *breviantennata* Hartmann-Schröder, 1959
13a. Dorsalmost compound setae not spinigerous but distinctly different from those below, with short, triangular blades 14
13b. Dorsalmost compound setae spinigerous with long, fine, filiform blades 15
14a. Adults with dorsal cirri on second setiger ..... *E.* (*E.*) *anomalochaeta* Benham, 1921 *12
14b. Adults without dorsal cirri on second setiger ..... *E.* (*E.*) *heterosetosa* McIntosh, 1885 *8, *28, *9
15a. Median antenna longer than prostomium and palps together 16
15b. Median antenna equal in length or shorter than prostomium and palps together 17
16a. Without eyes. Adults without dorsal cirri on second setiger ..... *E.* (*E.*) *longiantennata* Hartmann-Schröder, 1979 *21
16b. With eyes. Adults with dorsal cirri on second setiger ..... *E.* (*E.*) *longicornis* Westheide, 1974 *38
17a. Adults without dorsal cirri on second setiger ..... *E.* (*E.*) *multisetosa* Friedrich, 1956 *13
17b. Adults with dorsal cirri on second setiger 18
18a. Marked antero-posterior gradation in the shape of compound setae; falcigers of first setigers with proximal tooth very long and different from those of following segments ..... *E.* (*E.*) *rolani* n. sp.
18b. Slightly antero-posterior gradation; falcigers of first setigers similar to those of following segments ..... *E.* (*E.*) *dispar* (Webster, 1879)

Exogone (*Exogone*) *dispar* (Webster, 1879)

Exogone dispar: Perkins, 1981: 1090; Uebelacker, 1984: 30–43, fig. 30-36; Campoy, 1982: 290, pl. 21; San Martín, 1984: 221, fig. 52.

Material Examined.—Cuba: Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos; algae; 18 m depth; 2 specimens. Same station; inside coralline rock from rubble and

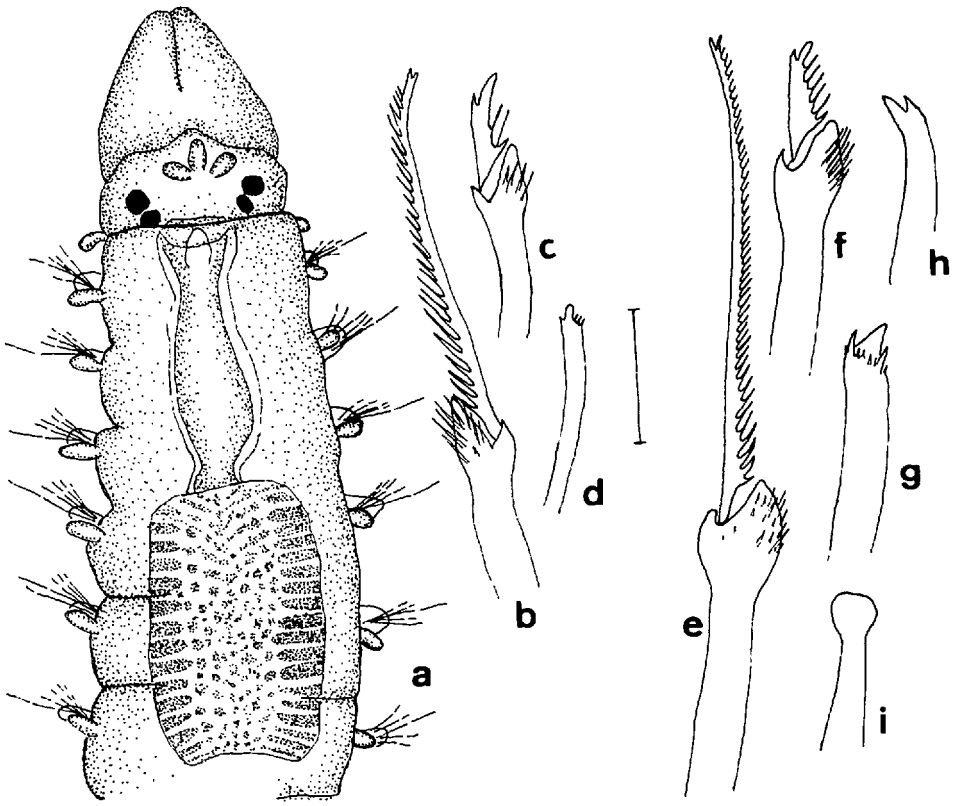

Figure 8. *Exogone* (*Exogone*) *breviantennata* Hartmann-Schröder, 1959: a, anterior end, dorsal view. Anterior segments: b, spiniger; c, falciger; d, dorsal simple seta. Posterior segments: e, spiniger; f, falciger; g, dorsal simple seta; h, ventral simple seta; i, acicula. Scale a: 64 μm. b, c, d, e, f, g, h, i: 10 μm.

pavament zone; 4 m depth; 3 specimens. Isle of Pines, off Punta del Francés, inside coralline rock from rubble and pavement zone; 1 m depth; 5 specimens.

Distribution.—East coast of North America. Gulf of Mexico. Cuba. Galapagos Islands. Western Mediterranean.

Exogone (*Exogone*) *breviantennata* Hartmann-Schröder, 1959
Figure 8

Exogone breviantennata Hartmann-Schröder, 1959: 125, figs. 75–78.
Exogone ovalis Hartmann-Schröder, 1960: 106, figs. 131–133.
Exogone breviantennata ovalis: Hartmann-Schröder, 1974b: 28.
Exogone occidentalis Westheide, 1974: 305, fig. 52.
Exogone verugera non Claparède, 1868: Haswell, 1920: 219, pl. 17, figs. 7–10; Berkeley and Berkeley, 1948: 78, fig. 116; Cognetti, 1957: 58; Day, 1967: 272, fig. 12.10 g–l; Amoureux, Rullier and Fishelson, 1978: 116; Gardiner, 1976: 132, fig. 11a–e; Imajima, 1966: 399, fig. 3; Rioja, 1943: 221, figs. 12–16; Imajima and Hartman, 1964: 116.

Material Examined.—Cuba: Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos; *Halimeda* sp. in *Thalassia testudinum* beds; 2 m depth; 12 specimens. Canal de los Vapores, Cayo Bocas de Alonso, Archipiélago de los Canarreos; in sponges on *Rhizophora mangle* roots; 0.5 m depth; 2 specimens. Same station; hydroids on *Rhizophora mangle* roots; 0.5 m depth; 4 specimens. U.S.A.: Florida, off Cape Canaveral, 28°36′39″N, 80°36′17″W; 21 m depth; sand and shell rubble; 1 specimen (FSBC I).

Remarks.—*E.* (*E.*) *breviantennata* is closely related to *E.* (*E.*) *verugera* Claparède, 1868, from the Mediterranean, North America, and European Atlantic coasts. The first was dorsal cirri on the second setiger, a short proventriculus through 2½–3 segments with about 20 muscle cell rows, and antennae in front of the eyes. The second lacks dorsal cirri on the second setiger, has a long proventriculus through 4–5 segments with a few more muscle cell rows, and antennae originating between the eyes, in addition to differing in details of setae.

Claparède's description of *E. verugera* is very confused. The drawing shows dorsal cirri on the second setiger, but antennae are placed between eyes. In other species described by Claparède, e.g., *Sphaerosyllis pirifera* and *S. hystrix,* dorsal cirri on the second setiger are drawn, but, in fact, are absent. Something similar occurs with its synonym *E. brevicornis* (Webster and Benedict, 1887); the drawing of Webster and Benedict, 1887, shows dorsal cirri on the second setiger but the syntypes (USNM) lack them. It is possible that the specimens of Claparède had no dorsal cirri on that setiger, but he drew them. All the specimens that have been studied from the Spanish Mediterranean area lack dorsal cirri on the second setiger, have a long proventriculus, and have antennae between the eyes; for this reason, I assume that they are *E. verugera,* and not *E. breviantennata.*

Hartmann-Schröder (1959) described *E. breviantennata* from El Salvador; later (1960), she described *E. ovalis* from the Red Sea; then in 1974 she defined *E. ovalis* as a subspecies of *E. breviantennata* (Hartmann-Schröder, 1974b). In my opinion, *E. occidentalis* Westheide, 1974, is also a synonym or subspecies of *E. breviantennata.* It is also possible that all of these are synonyms of *E. insignis* Langerhans, 1879, from Madeira, but the original description of Langerhans omits so many very important characters that it is impossible to be sure.

Distribution.—Probably circumtropical.

Exogone* (*Exogone*) *rolani new species
Figure 9

Material Examined.—Cuba: Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos; in coralline rock from rubble and pavement zone; 4 m depth; 2 paratypes (MNCNM). Canal de los vapores, Cayo Bocas de Alonso, Archipiélago de los Canarreos; in sponges on *Rhizophora mangle* roots; 0.5 m depth; holotype (MNCNM), one juvenile specimen. Isle of Pines, off Punta del Francés; in coralline rock; 1 m depth; 1 specimen. Off Cayo Matías, Archipiélago de los Canarreos; *Halimeda* sp.; 3 m depth; 3 specimens. U.S.A.: Florida, off Port Everglades, 26°7.7'N, 80°5'W; sand; 17 m depth; 2 paratypes (USNM).

Description.—Body long, filiform, indistinctly brownish-yellow; largest specimen without posterior end 5.5 mm long, 0.25 mm wide, 34 setigers. Prostomium pentagonal to rectangular, wider than long. Four large eyes very close on each side. Antennae originating very near each other in front of anterior pair of eyes. Median antenna long; 4.4 times longer than lateral ones on one paratype, similar in length to prostomium and palps together, but about 2.6 times longer than lateral antenna on holotype and remaining specimens. Lateral antennae oval, longer than dorsal cirri. Palps stout, longer than prostomium, fused except for terminal notch. Peristomium partially fused to prostomium, dorsally reduced, with only tentacular cirri remaining. Tentacular cirri oval, shorter than dorsal cirri. First setiger covering dorsal posterior margin of prostomium. Dorsal cirri on all setigers in adults, but not on setiger two of some juveniles, relatively longer than on other closely related species, pyriform, ovoid, or lemon-shaped; relatively larger posteriorly. Ventral cirri ovoid, shorter than dorsal cirri. Compound setae including spinigers with finely bidentate, slightly spinulose blades; falcigers with proximal tooth larger than distal

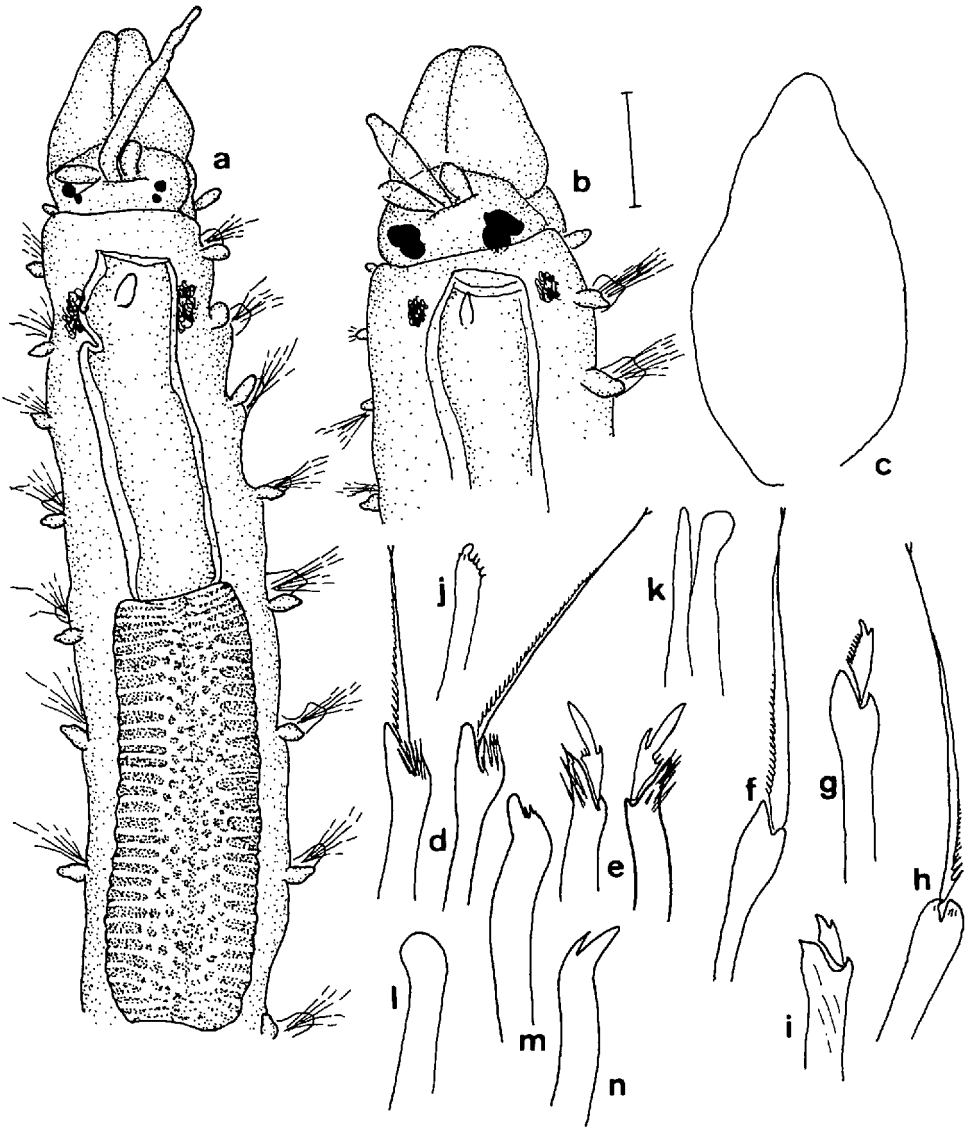

Figure 9. *Exogone* (*Parexogone*) *rolani* n. sp.: a, anterior end, dorsal view, paratype; b, anterior end, dorsal view, holotype; c, dorsal cirrus, midbody segment. Anterior 3–4 setigers: d, spinigers; e, falcigers; j, dorsal simple seta; k, aciculae. Other anterior and midbody segments: f, spiniger; g, falciger. Posterior segments: h, spiniger; i, falciger; l, acicula; m, dorsal simple seta; n, ventral simple seta. Scale a, b: 64 μm. c, d, e, f, g, h, i, j, k, l, m, n: 10 μm.

one. Parapodia of anterior 3–4 setigers each with two spinigers and about 7 falcigers, spinigers with blades 25–30 μm long, shafts distally enlarged, with long and fine spines on short part of hinge; falcigers with short, 9 μm length with secondary tooth disproportionally long, 1–2 small spines on margin, shaft with long, thin spines. Antero-posterior gradation in length and shape of setae very marked. Shafts progressively smoother, shafts of falcigers stouter with subterminal thickening, blades of falcigers with shorter secondary tooth and number of setae per parapodium

decreasing posteriorly; setae of each parapodium behind proventriculus numbering 1 spiniger and 2 falcigers, blades of spinigers 17 μm long. Simple dorsal setae present from setiger 2 or 3, solitary, anteriorly thin, with rounded tip, short subdistal spines; progressively stouter posteriorly with fewer spines, becoming S-shaped in posterior setigers with stout conical tip. Ventral simple seta in far posterior setigers, solitary, stout, smooth, S-shaped, bidentate with secondary tooth much longer than principal one. Anterior parapodia each with 2–3 aciculae, 1 bent and 1–2 pointed, thereafter only one, gradually thicker more posteriorly, with tip rounded. Pharynx through 4–5 segments with tooth slightly back from margin. Proventriculus through 3–5 segments, with about 25 muscle cell rows. Pygidium (juveniles) rounded with two long anal cirri.

Remarks.—The two small specimens lacking dorsal cirri on the second setiger have other characters identical to those of adults. The presence or absence of dorsal cirri on the second setiger has been thoroughly discussed in Syllidae. In other Exogoninae species, I have examined embryos lacking such cirri attached to the body of females, which have them. In my opinion, absence of such cirri is a neotenic character retained in adults of some species but not in others, and presence or absence of dorsal cirri on the second setiger is a useful character in segregating adults of similar species.

Discussion.—The general aspect of the body of *E.* (*E.*) *rolani* n. sp. is very similar to that of *E.* (*E.*) *dispar* (Webster, 1879), but they clearly differ in the shape and distribution of compound setae.

The species is most similar to *E.* (*E.*) *multisetosa* Friedrich, 1956, but the two species differ in the following characters: 1) *E.* (*E.*) *multisetosa* has antennae originating between the eyes and unidentate ventral simple setae, whereas antennae of *E.* (*E.*) *rolani* originate clearly in front of the eyes and ventral simple setae are bidentate; 2) the very conspicuous distribution of compound setae in *E.* (*E.*) *rolani* is apparently absent in *E.* (*E.*) *multisetosa*; 3) the peristomium on *E.* (*E.*) *multisetosa* is clearly separated from the prostomium, whereas they are fused on *E.* (*E.*) *rolani*; 4) *E.* (*E.*) *multisetosa* lacks dorsal cirri on the second setiger (see discussion under *E. longicornis* in Westheide, 1974), whereas they are present on adults of *E.* (*E.*) *rolani.*

Etymology.—The species is named in honor of Dr. Emilio Rolán Mosquera, member of the Cuban-Spanish Expedition and prestigious Spanish malacologist, who collected many of the polychaetes.

Exogone (*Exogone*) species A
Figure 7g

Material Examined.—U.S.A.: Florida, off Port Everglades, 26°6.9'N, 80°0.6'W; 178 m depth; silty sand; 1 specimen.

Remarks.—This specimen, missing a median antenna and with only one lateral antenna, generally agrees with descriptions of *E.* (*E.*) *naidina* Örsted, 1845, except that compound setae of the first two or three setigers are slightly different, the two long distal teeth of the blades being long and of similar length. Such blades of *E. naidina* (Ben-Eliahu, 1977; San Martín, 1984) have a short and a long tooth. Rullier (1974) cited three specimens of *E. gemmifera* Pagenstecher, 1862, a synonym of *E.* (*E.*) *naidina,* from Florida, and his specimens are possibly the same species as the specimen reported here.

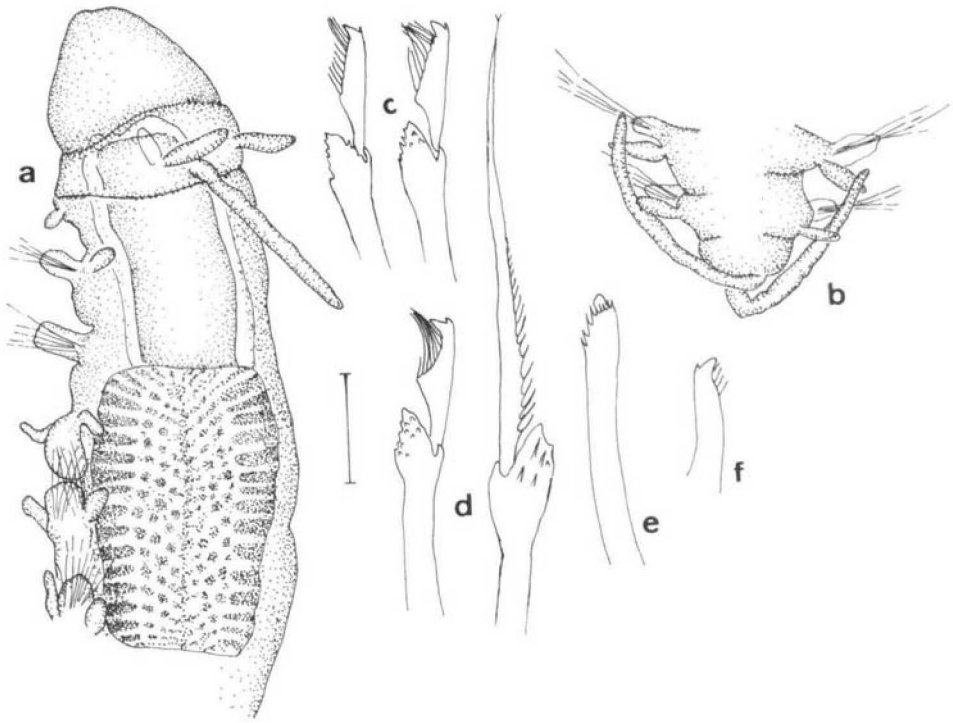

Figure 10. *Exogone* (*Exogone*) *longispinulata* n. sp.: Holotype. a, anterior end, dorsal view; b, posterior end, dorsal view; c, anterior compound setae. Midbody and posterior segments: d, spiniger and falciger; e, dorsal simple seta; f, ventral simple seta. Scale a, b: 32 μm. c, d, e, f: 10 μm.

Exogone* (*Exogone*) *longispinulata new species
Figure 10

Material Examined.—Puerto Rico: off Arecibo, 18°30'53"N, 66°42'08"W; clayey silt; 512 m depth; holotype (USNM).

Description.—Body long but relatively stouter than other *Exogone* species, 2.5 mm long, 0.15 mm wide, 41 setigers. Prostomium rectangular, broader than long. Eyes absent. Median antenna slightly longer than prostomium and palps together, originating at middle of prostomium. Lateral antennae nearly half length of median, originating at same level but separated from median antenna. Palps relatively short, broad, completely fused. Dorsal cirri oval, relatively long, absent on second setiger. Ventral cirri similar in length to dorsal ones, but more slender. Anterior parapodia each without spinigers, with 7 compound falcigers; blades of falcigers each with secondary tooth much longer than principal one, with minute principal tooth, with very long, fine, distally dressed row of spines, longer in distal part and surpassing tips; blades without marked dorsal-ventral gradation. Blades of falcigers of middle parapodia measuring 17–15 μm. Setae beginning on setiger 11 including 3–4 similar falcigers and 1 spiniger with long, thin, finely bidentate blade, about 50 μm long in median parapodia, with long subterminal spines. Solitary dorsal simple setae from setiger 3, similar to those of other species of subgenus *Exogone*. Solitary ventral simple setae in more posterior setigers; tips bidentate, with very small distal tooth. Two aciculae in each anterior parapodium, others with only one. Pharynx relatively short, broad; tooth broad, on anterior margin. Proventriculus of similar

length to pharynx, through 2 segments, with about 16 muscle cell rows. Pygidium trapezoidal, with two long anal cirri.

Etymology.—The name of the species refers to long spines of the blades of falcigers.

Exogone (*Exogone*) *lourei* Berkeley and Berkeley, 1948

Exogone lourei: Banse, 1972: 200, fig. 5a–d; Perkins, 1981: 1092; Uebelacker, 1984 (in part): 30–39, figs. 30–34.

Material Examined.—Cuba: Isle of Pines, off Punta del Francés; inside coralline rock from rubble and pavament zone; 1 m depth; 4 specimens (MNCNM). Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos; same habitat; 4 m depth; 4 specimens. Same station; *Halimeda* sp. in *Thalassia testudinum* beds; 2 m depth; 5 specimens (USNM). Same station; algae; 18 m depth; 2 specimens. Same station; coarse calcareous sand; 18 m depth; 2 specimens. Canal de Los Vapores, Cayo Bocas de Alonso, Archipiélago de los Canarreos; hydroids on *Rhizophora mangle* roots; 0.5 m depth; 1 specimen. Off Cayo Matías; *Turbinaria turbinata*; 3 m depth; 1 specimen. Off La Herradura, NW off La Havana; in tube of sabellid; 3 m depth; 1 specimen.

Remarks.—Two specimens have modified spinigers also on the first setiger.

Distribution.—Pacific coasts of U.S.A. and Canada. Gulf of Mexico. Cuba.

Exogone* (*Exogone*) *pseudolourei new species
Figure 11

Material Examined.—Puerto Rico: off San Juan, 18°30′53″N, 66°42.08′W; clayey silt; 512 m depth; holotype and paratype (USNM). Cuba: Isle of Pines, off Punta Pedernales; coarse calcareous sand; 35 m depth; 20 specimens (5 in MNCNM).

Description.—Body very long, filiform, 6.2 mm long, 0.12 mm wide, 55 setigers. Prostomium circular. Four eyes in trapezoidal arrangement. Antennae in front of eyes; all at same level. Median antenna fusiform, longer than prostomium, subterminally enlarged, terminally narrowed. Palps long, fused, with terminal notch. Peristomium well defined. Tentacular cirri oval, similar to dorsal cirri. Dorsal cirri on all setigers. Ventral cirri similar, but shorter. Parapodia with both spinigers and falcigers; blades of falcigers with proximal tooth much longer and stouter than distal one, longer (10 μm) and more spinose on anterior parapodia, shorter (5–6 μm) and nearly smooth on posterior parapodia. Spinigers of second setiger with enlarged, modified shafts provided with triangular process; distal margin of triangular process with small spines; blades of spinigers short, about 24 μm long on median parapodia. Anterior parapodia each with 9 falcigers, posterior ones with only 2. Solitary dorsal simple setae present from proventricular setigers; more anterior ones very slender, similar to those of other closely related species, progressively stouter posteriorly with one subterminal spine increasingly broader, acquiring shape of thick tooth; dorsal simple seta of far posterior setigers heavily bidentate with smooth and pointed secondary tooth stouter than principal one, principal tooth smaller, blunt, serrated below. Solitary ventral simple setae in posterior setigers, smooth, proximal tooth longer than distal one. Pharynx long, through 5 segments; tooth broad, slightly back from margin. Proventriculus short, through 1½ segments, with about 15 muscle cell rows. Pygidium trapezoidal, with two very long anal cirri.

Discussion.—*Exogone* (*E.*) *pseudolourei* is very similar to *E.* (*E.*) *lourei* Berkeley and Berkeley, 1948, but differs in the unique shape and thickness of posterior dorsal simple setae.

Etymology.—The name refers to the similarity of the species *E.* (*E.*) *lourei.*

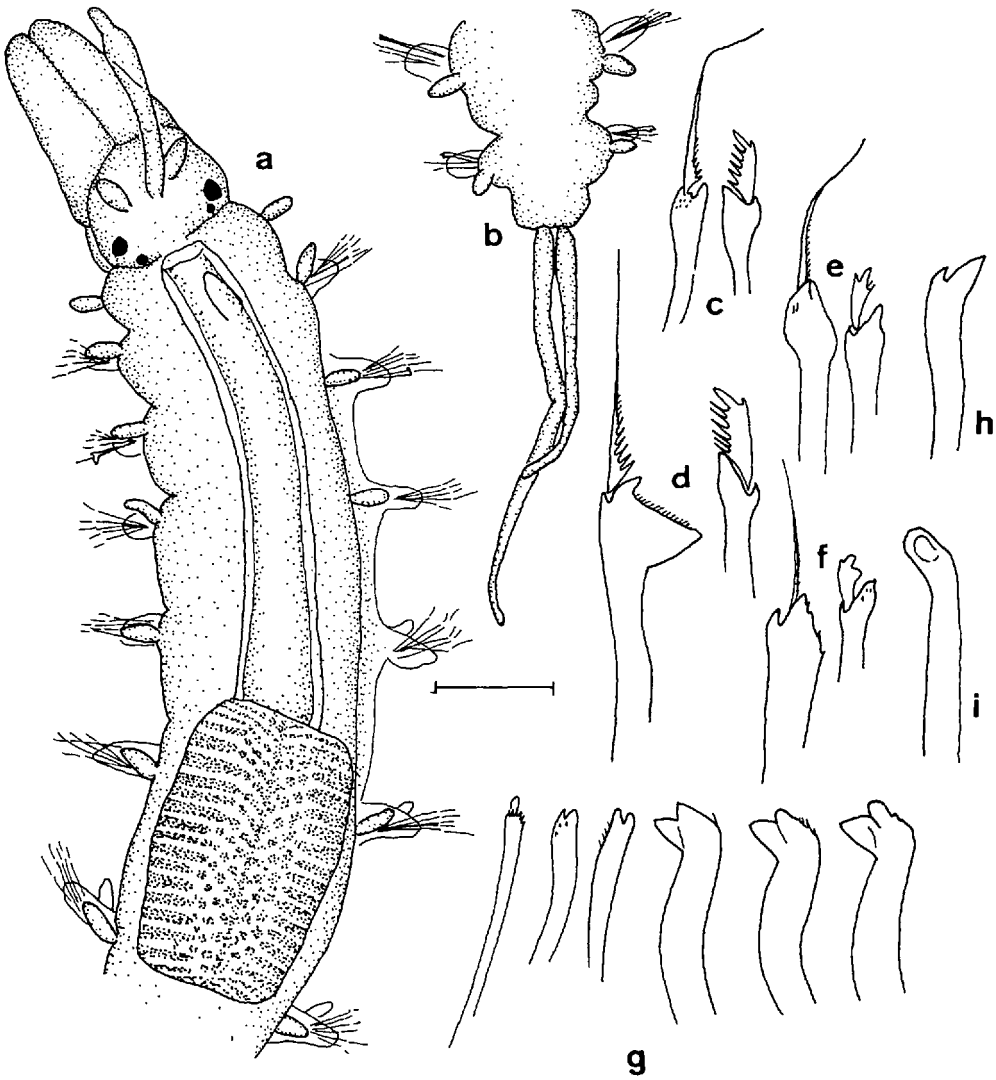

Figure 11. *Exogone* (*Exogone*) *pseudolourei* n. sp.: Holotype. a, anterior end, dorsal view; b, posterior end, dorsal view. Spiniger and falcigers: c, first setiger; d, second setiger; e, midbody setiger; f, posterior setiger; g, anterior (left) to posterior (right) gradation of shape and size of dorsal simple setae; h, ventral simple seta; i, acicula. Scale a, b: 32 μm. c, d, e, f, g, h, i: 10 μm.

Exogone (*Exogone*) *arenosa* Perkins, 1981

Exogone arenosa Perkins, 1981: 1094, figs. 5g–j, 6; *Exogone lourei* Uebelacker, 1984 (in part): 30–39, figs. 30–34.

Material Examined.—Cuba: Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos; inside coralline rock from rubble and pavement zone; 4 m depth; 6 specimens (USNM). Same station; *Halimeda* sp. in *Thalassia testudinum* beds; 2 m depth; 5 specimens (MNCNM). Same station; algae; 18 m depth; 1 specimen. Same station; coarse calcareous sand; 18 m depth; 1 specimen. Canal de Los Vapores, Cayo Bocas de Alonso, Archipiélago de los Canarreos; hydroids on *Rhizophora mangle* roots; 0.5 m depth; 4 specimens. Same station; in sponges; same situation and depth; 2 specimens. Off Punta Pedernales, Isle of Pines; coarse calcareous sand; 50 m depth; 1 specimen. Off Punta del Francés, Isle of Pines; inside coralline rock from rubble and pavement zone; 3 m depth; 1 specimen.

Remarks.—*Exogone* (*E.*) *lourei*, *E.* (*E.*) *arenosa* and *E.* (*E.*) *pseudolourei* are very similar species found in the same area. Both *E.* (*E.*) *lourei* and *E.* (*E.*) *pseudolourei* have a short proventriculus, whereas *E.* (*E.*) *arenosa* has a long proventriculus and was described with a spine on the tips of dorsal simple setae. Uebelacker (1984) included specimens with a long proventriculus and specimens with a short proventriculus in her account of *E. lourei* because she found that dorsal simple setae of specimens with a long proventriculus may or may not have a spine on the tips. Some specimens cited herein as *E.* (*E.*) *arenosa* do not have a clear spine on tips of dorsal simple setae, but can be separated from *E.* (*E.*) *lourei* on the basis of differences in the length of the proventriculus.

Distribution.—Florida. Gulf of Mexico. Cuba.

Exogone (*Exogone*) species B

Material Examined.—Between Punta del Este, Isle of Pines, and Cayo Matías, Archipiélago de los Canarreos; *Halimeda* sp. on *Thalassia testudinum* beds; 2 m depth; 2 specimens.

Remarks.—These specimens are for the most part in agreement with the description of *E.* (*E.*) *uniformis* Hartman, 1961, of Banse, 1972. However, they have a much shorter proventriculus, through 2–3 segments, with 19–27 muscle cell rows. One specimen lacks dorsal cirri on the second setiger. Perhaps they are juveniles.

Subgenus *Sylline* Claparède, 1864

Type Species.—*Sylline brevipes* Claparède, 1863.

Diagnosis.—Compound setae bayonet-shaped by partial fusion of shafts and blades or with blades absent; shafts tips or tips of simple setae generally truncated and serrated.

Remarks.—Only one species of this subgenus is reported herein, *E.* (*S.*) *naidinoides* Westheide, 1974.

Key to Species of *Sylline*

1a. Only simple setae formed by loss of blades ... *E.* (*S.*) *simplex* Hartmann-Schröder, 1960 *17, *21
1b. Parapodia with simple setae and compound setae with partially fused shafts and blades ... 2
2a. Without ventral cirri (?). Dorsal cirri on all setigers. Blades of compound setae both long and short, fine, unidentate; short blades provided with 1–2 accesory spines at bases ... *E.* (*S.*) *brevipes* (Claparède, 1864) *11
2b. With ventral cirri. Adults without dorsal cirri on second setiger ... 3
3a. Prostomium clearly separated from peristomium. Bayonet-shaped setae with long blades ... *E.* (*S.*) *spinisetosa* Hartmann-Schröder, 1981 *23
3b. Prostomium more or less fused to peristomium ... 4
4a. Bayonet-shaped setae in middle and posterior parapodia with long and short blades ... *E.* (*S.*) *naidinoides* Westheide, 1974
4b. Bayonet-shaped setae all thin and similar ... *E.* (*S.*) *fustifera* Haswell, 1920 *27

Exogone (*Sylline*) *naidinoides* Westheide, 1974
Figure 11a–f

Westheide, 1974: 301, figs. 50, 51e, f.

Material Examined.—Cuba: Canal de Los Vapores, Cayo Bocas de Alonso, Archipiélago de los Canarreos; hydroids on *Rhizophora mangle* roots; 0.5 m depth; 2 specimens (1 specimen, USNM). Isle of Pines, off Punta del Francés; inside coralline rock from rubble and pavement zone; 1 m depth; 1 specimen (MNCNM).

Distribution.—Galapagos Islands. Cuba.

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